

blizzard 1997 8.jpg







- Prairie Snow: thin snow, wind, lakes, agriculture (soybean, corn, some bare soils)
- Substrate conditions: vegetation, frozen soil
- Spatial heterogeneity
- Vertical heterogeneity: Freeze-thaw cycles, ice lensing, depth hoar
- Wet snow: melt season, transitional snow/rain precipitation types
- Albedo
- Wind effect on Prairie snow: SD/SWE distribution, wind packing, sublimation
- Flooding due to snowmelt
- Snow on lake ice

### **Big questions:**

- 1. Substrate: frozen/thawed soil, vegetation, till/no till agriculture**
- 2. Wind redistribution/sublimation/albedo**
- 3. Freeze-thaw/phase change/vertical heterogeneity**

## Essential **characteristics** of the site and campaign

- ➔ Variation in surface types (agriculture, grasslands, lakes?)
- ➔ Logistical ease (permissions & access, power, nearby airport, existing networks?, internet?)
- ➔ Local snow researcher(s) (to take on main responsibilities)
- ➔ Time series approach (to capture antecedent conditions, snow evolution, melt period, freeze-thaw cycles)
- ➔ Flexibility in sites? (snow doesn't always fall where we want in this region)
- ➔ Flexibility in campaign timing? (snow doesn't always fall when we want in this region)
- ➔ Watershed? (to close water budget)

Candidate sites:

- ➔ Red River of the North
- ➔ Yellowstone watershed, MT
- ➔ NRCS ranch, MT
- ➔ Brookings, SD
- ➔ **Canada partnership???**

## **Candidate sensors/techniques**

### **1. Airborne**

- ➔ Untested/Not operational: Active & passive L, L InSAR, active C , X, & Ku, LiDAR
- ➔ Operational: AMSR-E-like, gamma, optical

### **2. GBRS, in-situ snowpits**